

TRIM.FaTE USER'S GUIDE

MODULE 9: SCENARIO PROPERTIES

This module provides guidance on the scenario properties of a TRIM.FaTE scenario. The information in this module is divided into three sections (plus references):

- (1) A description of the role of TRIM.FaTE scenario properties;
- (2) Instructions on how to set scenario properties; and
- (3) A summary of the scenario properties required for a TRIM.FaTE scenario.

1. ROLE OF SCENARIO PROPERTIES

Scenario properties direct the actual “running” of the TRIM.FaTE model. They are set by the user on the Scenario view and are independent of the library (i.e., scenario properties are “built in” to the model). These properties set the general modeling parameters that define how the model calculates, stores, and presents results.

For the current test cases, some of the meteorological properties (e.g., air temperature, wind speed) have been defined as scenario properties. However, meteorological properties are not hard-wired into the model and do not need to be set as scenario properties; for example, meteorological properties could be set as properties of volume elements. This approach would allow the use of multiple sets of meteorological data (e.g., from multiple stations) within the modeling study area. Meteorological properties are explained in detail in Module 10 and are not discussed in the remainder of this module.

2. SETTING SCENARIO PROPERTIES

Scenario property values can be set by the user on the Scenario view within the Scenario window (see Figure 1). Properties can be edited directly in the Property Editor on the right side of the view. To edit a value, double-click the cell to be edited, delete the existing value, and type in the new value. Remember to push the “Enter” key after changing the value (if Enter is not pushed, the change will not be saved in the scenario).

Alternatively, scenario properties can be included in a Property Import file and imported as a part of the scenario set-up process. A section of the Property Import file that contains the scenario properties for averaging interval, output directory, and simulation begin and end dates and times would be formatted as follows:

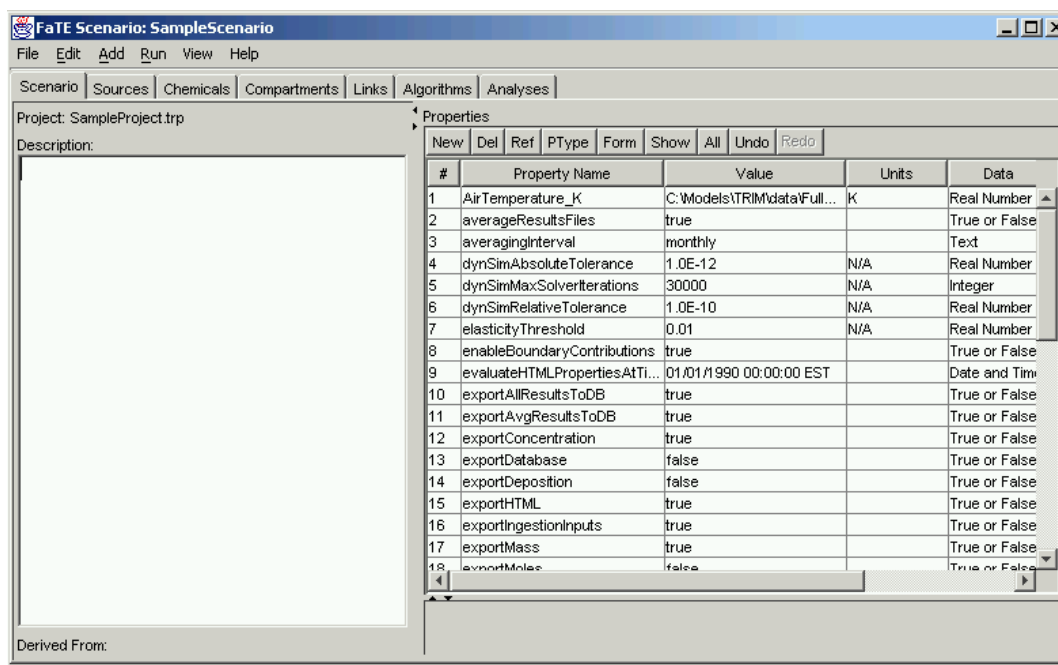
```
Scenario: TestSite
Property: averagingInterval
Value: monthly
Property: outputDir
Value: \\Models\\TRIM\\data\\results\\TestSite
Property: simulationBeginDateTime
Value: 01/01/1990 00:00:00 EST
Property: simulationEndDateTime
Value: 02/01/1995 00:00:00 EST
```

Refer to Module 3, Library and Scenario Data Files, for formatting requirements for the Property Import file and detailed instructions on how to set up and use this file.

USER TIPS: SETTING THE SCENARIO PROPERTIES

- < If an HTML output file is to be created, make sure the designated date for an HTML export (i.e., the property *evaluateHTMLPropertiesAtTime*) is set within the start/stop dates. Setting this date outside of the start/stop dates will lead to an error during scenario verification.
- < In general, all scenario properties must be assigned values by the user before attempting to verify a scenario. Exceptions include *averagingInterval* and *evaluateHTMLPropertiesAtTime*, which can remain “<Unset>” in some instances (see Table 1 for details).
- < The user can instruct TRIM.FaTE to automatically average results by setting the scenario property *AverageResultsFiles* to true. The model would then calculate a mathematical average for each output value for a the time period (e.g., every 4 hours, monthly) specified by the user with the scenario property *AveragingInterval*. Alternatively, the user could perform these averaging calculations manually after the run is completed using the Averager tool or tools external to TRIM.FaTE.

Figure 1
Scenario View



3. SUMMARY OF SCENARIO PROPERTIES

The scenario properties created by TRIM.FaTE with the creation of a new scenario are described in Table 1.¹

Table 1
Scenario Properties

Property Name	Type of Data	Description
<i>appendNumberToRun</i>	true/false	When this value is true, TRIM.FaTE appends a number (e.g., 0, 1, 2) to the end of each output file name. This option prevents the model from writing over the output files of a previous simulation within the current session. However, once the model has been shut down and restarted, TRIM.FaTE may overwrite previous output files. This property is not included in the Scenario window by default, and thus it must be added if the user wants to use a value other than the default of “true.”
<i>averageResultsFiles</i>	true/false	After a TRIM.FaTE simulation has completed, TRIM will automatically average your results files using the averaging period that the user specifies with the <i>averagingInterval</i> property.
<i>averagingInterval</i>	real number (integer), or “monthly” or “annual”	An integer specifying the number of hours to average in the results files (could also be 'monthly' or 'annual'). Although this property is always included in the scenario, the user can leave it as <Unset> if they set <i>averageResultsFiles</i> to “false.”
<i>dynSimAbsoluteTolerance</i>	real number	When <i>simulateSteadyState</i> is false, the absolute error tolerance for the differential equation solver.
<i>dynSimMaxSolverIterations</i>	real number (integer)	When <i>simulateSteadyState</i> is false, the maximum number of iterations the differential equation solver should use before giving up.
<i>dynSimRelativeTolerance</i>	real number	When <i>simulateSteadyState</i> is false, the relative error tolerance for the differential equation solver.
<i>elasticityThreshold</i>	real number	For a sensitivity analysis, the elasticity below which the sensitivity results should be set to 0. Elasticity is the percent change in output divided by the percent change in input. If a property has a small elasticity, it can still sometimes cause a false positive and show up as an important parameter, but the elasticity indicates how much relative change resulted from that parameter.
<i>enableBoundaryContributions</i>	true/false	When this is false, TRIM.FaTE will ignore the <i>BoundaryContribution</i> properties in compartments; otherwise, it will include them as boundary sources.
<i>evaluateHTMLPropertiesAt Time</i>	date and time (mm/dd/yyyy HH:MM:SS TimeZone)	The date/time at which the values of properties should be evaluated in the HTML export. Although this property is always included in the scenario, the user can leave it as <Unset> if <i>exportHTML</i> is set to “false.”

¹If needed, additional properties can be added to the scenario by the user using the “New” button in the Scenario view of the Scenario window.

Property Name	Type of Data	Description
<i>exportAllResultstoDatabase</i>	true/false	When this value is true, the raw data (i.e., the outputs at the output time steps) from FaTE are exported to the output data files (only applies if <i>exportIngestionInputs</i> or <i>exportRiskECOInputs</i> is true).
<i>exportAvgResultstoDatabase</i>	true/false	When this value is true, the averaged data files (i.e., the outputs at the <i>averagingIntervals</i>) from FaTE are exported to the output data files (only applies if <i>exportIngestionInputs</i> or <i>exportRiskECOInputs</i> is true).
<i>exportConcentration</i>	true/false	When this value is true, the results are output in concentration units.
<i>exportDeposition</i>	true/false	When this value is true, the four deposition values (wet particle, dry particle, wet vapor, and dry vapor) are exported (in units of g/day-m ²) to the output data files.
<i>exportHTML</i>	true/false	When this value is true, the HTML export for the point in time specified by the <i>evaluateHTMLPropertiesAtTime</i> property is created after the FaTE simulation has completed.
<i>exportIngestionInputs</i>	true/false	When this value is true, the inputs needed for the Expo/Ingestion module are exported to the FaTE output data files.
<i>exportMass</i>	true/false	When this value is true, the results are output in mass units.
<i>exportOutdoorEnvironment BeforeRun</i>	true/false	When this value is true, an Outdoor Environmental Export is automatically performed when a simulation is run.
<i>exportPropertiesBeforeRun</i>	true/false	When this value is true, a Scenario Property Export is automatically performed prior to the simulation.
<i>exportRiskECOInputs</i>	true/false	When this value is true, the inputs needed for the Risk/Eco module are exported to the FaTE output data files.
<i>fateVersion</i>	text	Indicates the version of the TRIM.FaTE model that is currently being run; this property allows the version number to appear in HTML and property exports.
<i>FractionInitialConcentration</i>	real number	The fraction of the initial concentrations in each compartment to be included in the simulation.
<i>outputDir</i>	directory (e.g., c:\data\results)	Indicates the directory where Simulation output data files should be written.
<i>RiskECODatabase</i>	database (with file location)	Indicates the name of the Risk/Eco toxicity benchmarks database to be used when mapping FaTE biota to Risk/Eco. This name refers to the MySQL database in the root MySQL directory on the user's computer.
<i>Run_ID</i>	[set by TRIM]	The Run_ID for the current simulation. This value is set automatically by the model at run time (i.e., the user does not need to specify the value).
<i>significantDigits</i>	real number (integer)	The number of significant digits to use when writing results to a file. For example, a value of 4 would cause results to have the form 9.999E9.
<i>simulateSteadyState</i>	true/false	Directs the model to perform a steady state simulation (if true) or time-varying simulation (if false).

Property Name	Type of Data	Description
<i>simulationBeginDateTime</i>	date/time (mm/dd/yyyy HH:MM:SS TimeZone)	The date and time at which the simulation should begin.
<i>simulationEndDateTime</i>	date/time (mm/dd/yyyy HH:MM:SS TimeZone)	The date and time at which the simulation should end, inclusive.
<i>simulationStepsPerOutput Step^a</i>	real number (integer)	The number of simulation time steps in each output time step (simulation results will be output only at each output time step). To output results at each simulation time step, set this value to 1.
<i>simulationTimeStep^a</i>	real number (integer)	The duration (in hours) of each simulation time step.
<i>steadySimAbsoluteTolerance</i>	real number	When <i>simulateSteadyState</i> is true, the absolute error tolerance for the linear equation solver.
<i>steadySimMaxSolver Iterations</i>	real number (integer)	When <i>simulateSteadyState</i> is true, the maximum number of iterations the linear equation solver should use before giving up.
<i>steadySimRelaxationParam</i>	real number	When <i>simulateSteadyState</i> is true, the relaxation parameter for the Jacobi linear equation solver.
<i>timeZoneForResults</i>	time zone (e.g., EST)	The time zone for which to output the simulation results.
<i>zeroSmallAmounts</i>	true/false	Whether to zero out calculated masses that are less than the absolute tolerance.

^a Refer to Volume I of the TRIM.FaTE Technical Support Document (EPA 2002) for more details on setting these time-related properties.

4. REFERENCES

U.S. Environmental Protection Agency. 2002. TRIM.FaTE Technical Support Document. Volume I: Description of Module. EPA-453/R-02-011a. Office of Air Quality Planning and Standards.

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